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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,138	09/12/2003	Richard Henry Pohle	TXT05-05	7752
57604	7590	01/25/2006		
DAVID E. HUANG, ESQ. BAINWOOD HUANG & ASSOCIATES LLC 2 CONNECTOR ROAD SUITE 2A WESTBOROUGH, MA 01570			EXAMINER RATCLIFFE, LUKE D	
			ART UNIT 3662	PAPER NUMBER

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/661,138	<b>Applicant(s)</b> POHLE ET AL.	
	<b>Examiner</b> Luke D. Ratcliffe	<b>Art Unit</b> 3662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 9/12/2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 27-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19, 22, 23, 25 and 37-40 is/are rejected.
- 7) ☒ Claim(s) 21, 22, 24 and 26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/12/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |  |
|---|--|
| <p>1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br/>Paper No(s)/Mail Date _____.</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)<br/>Paper No(s)/Mail Date. _____.</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</p> <p>6) <input type="checkbox"/> Other: _____.</p> |
|---|--|

## **DETAILED ACTION**

### ***Claim Objections***

Claim 1 is objected to because of the following informalities: The wording of the claim with respect to line 13 of the claim when the "deconvolution operable to deconvolve said point spread function from said two or more two-dimensional image slices" is confusing. The word "from" denotes two situations; the first situation is that the point spread function was product of the deconvolved two-dimensional image slice for use, denoting that the origins of the point spread function came from the two-dimensional image, or that the point spread function was deconvolved out of the two-dimensional image. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 7, 14-16, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6445714) in view of Avinash (5561611).**

Referring to claims 1, 14, and 40, Iijima shows directing light to an object (figure 2 Ref 1), receiving that light through atmospheric turbulence that is inherent in all light imaging systems, one image sensor to produce two-dimensional slices of an object (figure 5), and a second image sensor to produce a second set of images (figure 5), and

a means of combining the images to produce a three dimensional representation of the object (figure 30A-30C and column 10-20). However Iijima does not show a means to overcome the atmospheric turbulence that may cause blurred images.

Avinash does show using multiframe blind deconvolution to make a point spread function (column 2 lines 54-65), and then using deconvolution the subsequent point spread function from a set of two-dimensional images to deblur the images (column 2 lines 30-65). It would have been obvious to modify Iijima to include the deblurring deconvolution taught by Avinash because this allows for clean digital images of an object and is also taught in Nelson (6288974) column 3 line 15 to column 6 line 20.

Referring to claim 7, it would be obvious with the combination of Iijima and Avinash to use the computer medium taught by Iijima to have instructions to perform the steps of combining the deblurred two-dimensional image slices and forming a three-dimensional image of the target.

Referring to claims 15 and 16, Iijima includes a method for storing two or more two-dimensional image slices.

**Claims 2-4 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6445714) in view of Avinash (5561611) as applied to claim 1 above, and further in view of Torunoglu (2002/0114531).**

Referring to claims 2, 3, and 18 Torunoglu shows a second light source that is a laser directed to a target (column 6). It would have been obvious to further modify Iijima to include the second light source that is a laser to increase the probability that the light

receivers will receive light reflected from the target. It would have been obvious to further modify Iijima to include a laser because this is a common light source and direct it at the target.

Referring to claim 4 Torunoglu shows a second light source that is a laser (column 6). It would have been obvious to use laser can be quasi-coherent or temporally coherent, coherent, or incoherent because these are all well known types of lasers.

**Claims 5-7 rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6445714) in view of Avinash (5561611) as applied to claim 1 above, and further in view of Nelson (6288974).**

Referring to claims 5 and 6 Nelson shows a deconvolution function that is done by a processor (column 5 lines 15-30). It would have been obvious to further modify Iijima to include the deconvolution process done by a processor because this reduces the probability of human error doing mathematical computations.

Referring to claim 7 it would have been obvious if one were to include the combination of two dimensional slices taught in Sapia that they would also have a processor as taught by Nelson combine the two dimensional.

Referring to claim 29-32 it would have been obvious if one were to include the combination of the point spread function, the multiframe blind deconvolution, the deconvolution to determine the two dimensional image slices, and means for combining the slices taught in Sapia that they would also have a processor as taught by Nelson determine combination of the point spread function, the multiframe blind

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deconvolution, the deconvolution to determined the two dimensional image slices, and means for combining the slices.

**Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6445714) in view of Avinash (5561611) as applied to claim 1 above, and further in view of Carlson (5659413).**

Carlson shows a laser that is directed by a laser beam director (column 16 line 30-45). It would have been obvious to further modify Iijima to include the laser beam director because a beam director is a common and efficient means to direct a laser beam.

**Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6445714) in view of Avinash (5561611) as applied to claim 1 above, and further in view of Housand (6359681).**

Housand shows a laser that has an active medium made of ND:YAG (column 8 lines 50-65). It would have been obvious to further modify Iijima to include the ND:YAG laser taught in Housand because this is a common type of laser used.

**Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6445714) in view of Avinash (5561611) as applied to claim 1 above, and further in view of Oraevsky (6309352).**

Oraevsky shows a fluence that is between 0.1 and 100 Joules per pulse (column 5 lines 30-60). It would have been obvious to further modify Iijima to include the limited pulse Joules amount as taught by Oraevsky because this limits the amount of energy used by the light source.

**Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6445714) in view of Avinash (5561611) as applied to claim 1 above, and further in view of McLean (H1783).**

Referring to claims 11 and 12 McLean shows a pulse width of .5 nanoseconds (column 2 lines 50-65). It would have been obvious to further modify Iijima to include a pulse width that was .5 nanoseconds because this sets a limit for modulation purposes.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6580496) in view of Sapia (6166853) as applied to claim 1 above, and further in view of Hutson (5455806).

Hutson shows a method for compression is operable to receive compress and transmit two or more pulses (column 1 lines 15-45). It would have been obvious to further modify Iijima to include the compression taught in Hutson because the compression of data will make it easier to save data to a medium.

**Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6445714) in view of Avinash (5561611) as applied to claim 1 above, and further in view of Shirai (2001/0050764).**

Shirai shows a light sensor receiving sunlight through atmospheric turbulence (column 13). It would have been obvious to further modify Iijima to include the received sunlight from an object because this intensifies the light received from the object.

**Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6445714) in view of Avinash (5561611) as applied to claim 1 above, and further in view of Cohen (5784492).**

Cohen shows a deconvolution that has priori knowledge of the point spread function (column 2 lines 15-45). It would have been obvious to further modify Hamji to include the priori knowledge taught by Cohen because this allows transmission of non-redundant information.

**Claim 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6445714) in view of Avinash (5561611) as applied to claim 1 above, and further in view of Li (5602934)**

Referring to claims 22 and 23 Li calculates a noiseless image of a target and gradients of noiseless image (column 3 and column 4). It would have been obvious to further modify Iijima to include the noiseless target and gradient of target as taught in Li because this increases the accuracy of the image.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6580496) in view of Sapia (6166853) as applied to claim 1 above, and further in view of DuBruco (5231281).

DuBruco teaches a system that uses a sieve (column 24 lines 45-65). It would have been obvious to further modify Iijima to include the sieve as taught by DuBruco to because it creates the right color in every unit of pixels.

**Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6445714) in view of Avinash (5561611) as applied to claim 1 above, and further in view of Kracutner (6130641).**

Kracutner shows a first sensor that is a time of arrival sensor (column 2 lines 15-45). It would have been obvious to further modify Iijima to include the time of arrival



sensor as taught by Kracutner because this allows for a simple way to determine what time the signal was received to determine parameters of the target.

**Claims 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (6445714) in view of Avinash (5561611) as applied to claim 1 above, and further in view of Witthoft (5164578)**

Referring to claims 38 and 39, Witthoft shows a beam splitter that splits the input between two photodetector arrays (figure 3 Ref 198, 192, and 158). It would have been obvious to use the photodetector arrays and the beam splitter taught by Witthoft because these are common for the application and add no new or unexpected results.

***Allowable Subject Matter***

Claims 20, 21, 24, and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luke D. Ratcliffe whose telephone number is 571-272-3110. The examiner can normally be reached on 8:00-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on 571-272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LDR

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